

## Objective

- Design and build a small self-contained prototype single lens concentrating RAINBOW system, to be tested outdoors with the sun and by a LAPSS system. We will coordinate with industrial panel manufacturers to achieve lightweight high quality designs and materials.

## Approach

- Develop a new lightweight thin film parabolic prism concentrator, spectral splitter.
- Demonstrate the ability to split the spectrum over a array of different bandgap solar cells.
- Create a breadboard prototype demonstrating multi-bandgap spectral splitting power system.

## Resources

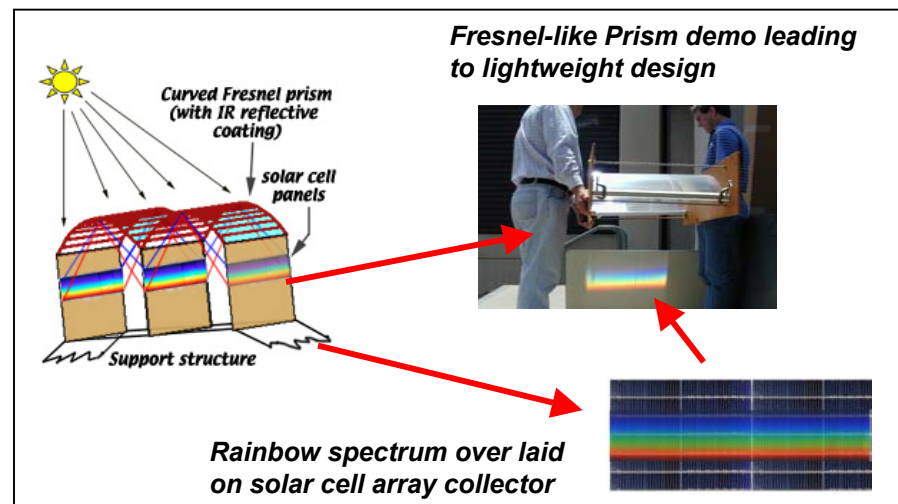
\$147K, 1.2 FTE

## PROGRESS/ACCOMPLISHMENTS

- Developed new lightweight thin film parabolic prism concentrator, spectral splitter.
- Demonstrated the ability to split the spectrum over a array of different bandgap solar cells.
- Created a breadboard prototype demonstrating multi-bandgap spectral splitting power system.
- Completed development of thin sheet prism array
- Designed and fabricated array housing and support structure
- Ray trace modeling for design of solar cell housing underway
- Solar cell integration delayed due to personnel unavailability until mid-July

## FUTURE MILESTONES

- Solar cell integration with array Date: July 31
- Prototype fabrication/testing Date: Sept 30

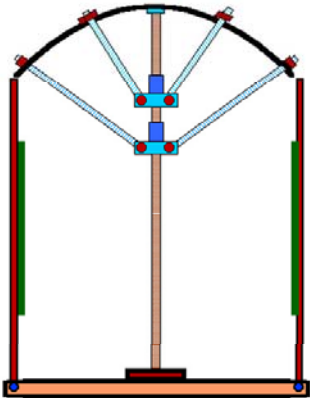


## DELIVERABLES

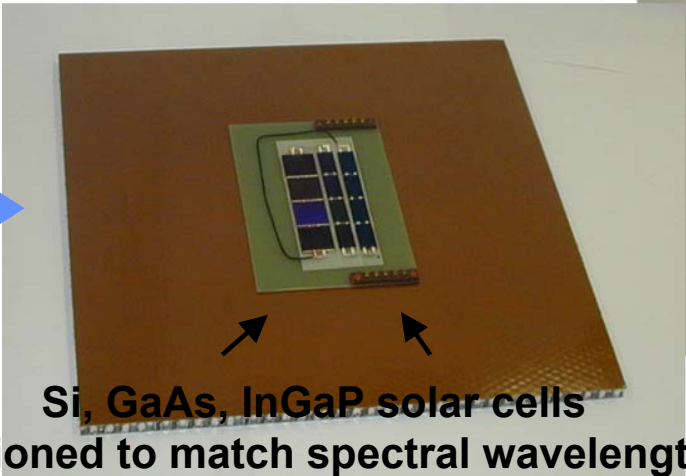
- Portable prototype demonstrating the multi-spectral array concept
- Final report summarizing the Rainbow task

*SSEP*

Thin film parabolic  
prism array



Adjustable solar cell  
array substrate

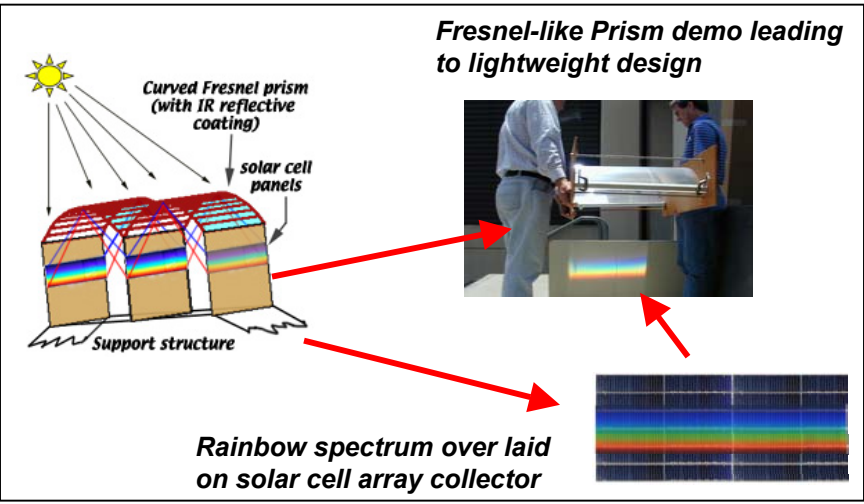


# Power Generation: Rainbow

## SSEP

### Task FY'02 Milestones/Products:

- Complete development of thin sheet prism array
- Active multi-cell array fabrication and integration, (\$30K required for solar cells)
- Demonstrate an Integrated Prototype System
- Characterize and Optimize System Performance (depending on available funds)



	FY'02			
	Q2	Q3	Q4	Q1
•Thin sheet prism array design				
•Multi-cell array integration with structure				
•Fabrication of integrated prototype system				
•Characterize/optimize system performance				

Virgil Shields

### Resources:

<u>Resources.</u>						
Actuals	Planned					
FY'02	FY'02	FY'03	FY'04	FY'05	FY'06	

#### SSP Funding:

\$147K	\$147K		\$	\$	\$
--------	--------	--	----	----	----

#### Other-than-SSP Funding:

		\$	\$	\$	\$
--	--	----	----	----	----

#### FTE's (civil servants and JPL): [Full Time Equivalents]

0.8	0.8				
-----	-----	--	--	--	--

#### EP's (contractors): [Equivalent Persons]

--	--	--	--	--	--

### Participants:

P.O.C. Virgil Shields and Nick Mardesich